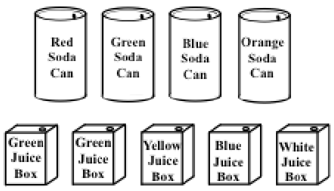
Name: ______________________________

Final Exam Review – End of Unit 10

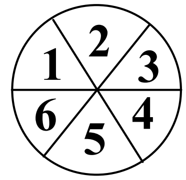
Unit 10: Probability

1. You have 4 soda cans and 5 juice boxes in a cooler, as shown in the diagram. You randomly choose one soda and one juice box from the cooler.



   a. How many different combinations of 1 soda and 1 juice box are there? Show your calculations.
   b. What is the probability of choosing an orange soda can or a yellow juice box?
   c. What is the probability of choosing an orange soda can and a yellow juice box?

2. Felix randomly spins the spinner.



If he spins four times, what is the probability that he will spin a number greater than 2 each time? Show your reasoning.

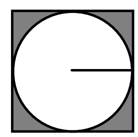
Unit 9: Volume

3. The volume of a cone is 314 cubic centimeters and the height of the cone is 3 centimeters. What is the radius of the cone to the nearest whole number?

Unit 8: Circles

4. Which of the following statements are true?
   a. A tangent will always intersect a circle in exactly two points.
   b. A secant will always intersect a circle in exactly two points.
   c. A diameter is not a chord.
   d. A secant cannot extend outside of a circle.

5. A circle is inscribed in a square. If the radius of the circle is 5 inches, what is the area of the shaded region?

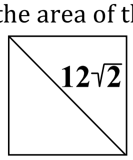


Unit 7: Quadrilaterals

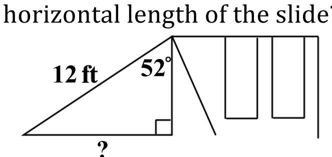
6. Which of the following statements are NOT true?
   a. The diagonals of a rectangle will always be congruent.
   b. The diagonals of a rhombus will always be congruent.
   c. The diagonals of parallelogram bisect each other.
   d. The diagonals of a square will always be perpendicular.

Unit 6: Right Triangle Trigonometry

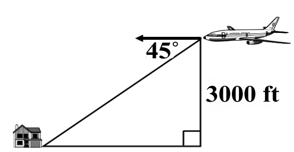
7. The figure shown is a square. What is the area of the square?



8. In the diagram shown, a 12-foot slide is attached to a swing set. The slide makes a 52˚ angle with the swing set. Which answer most closely represents the horizontal length of the slide?



9. Irina is flying an airplane at an altitude of 3000 ft. She sees her house on the ground at a 45˚ angle of depression. What is Joanna's horizontal distance from her house at this point?



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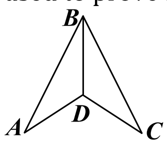
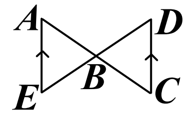
Unit 5: Similar Triangles

10. In the figure shown, $\triangle$ABC and $\triangle$DEF are isosceles triangles with a vertex angle at D. $\overline{AB} \cong \overline{BC}$. Which theorem could be used to prove $\triangle$ABD $\cong\triangle$CBD?

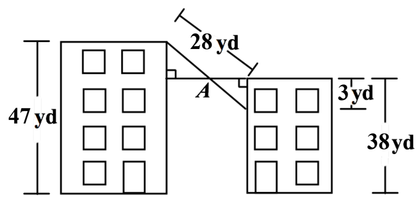


11. Which is NOT a valid conclusion that you can draw from this picture?

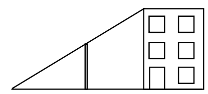


a. $\triangle$ABE ~ $\triangle$ CBD
b. Slope of $\overline{AB}$ = slope of $\overline{BC}$
c. $\frac{AB}{CB} = \frac{DB}{EA}$
d. $\frac{AE}{AB} = \frac{CD}{CB}$

12. Two kids decided to string a rope from the roof of a 47 yard tall building to a window on the side of a 38 yard tall building so that they could send a bucket full of toys into the window. On their first try, the bucket got stuck on a clothesline at point A. How far is the bucket from the window?



13. A 63-meter-long support wire for a light pole runs from the top corner of a 27-meter-tall building to a point on the ground, forming a straight line. The length of the wire from the top of the building to the top of the light pole is 42 meters. How tall is the light pole?



Geometry:

14. What is the name of the reason that states "On $\triangle$PQR, $m\angle PQR + m\angle QRS + m\angle RSP = 180°$."
a. Addition Property of Equality
b. Triangle Sum Theorem
c. Angle Addition Postulate
d. Definition of a bisector

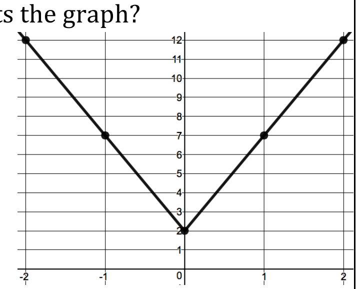
15. Which of the following statements is NOT true?
a. The base of an isosceles triangle is bisected by the altitude.
b. The three angles on an equilateral triangle will always be congruent.
c. The vertex angle of an isosceles triangle must be congruent to the two base angles.
d. The base angles of an isosceles triangle must be congruent to each other.

16. Which of the following is NOT true?
a. Two planes cannot be parallel.
b. A line and a plane can have an infinite number of intersection points.
c. Two lines can have an infinite number of intersection points.
d. A line and a plane can have exactly one point of intersection.

Inverses and Other Functions:

17. A kids train at the mall approaches the play area that is 2 feet from the end of the track. The graph models the train traveling at a constant speed. Which equation best represents the graph?

a. $f(x) = |5x|$
b. $f(x) = |x + 5|$
c. $f(x) = |5x + 2|$
d. $f(x) = |5x| + 2$



18. Given the function $f(x) = 5x + 25$, write the inverse function.

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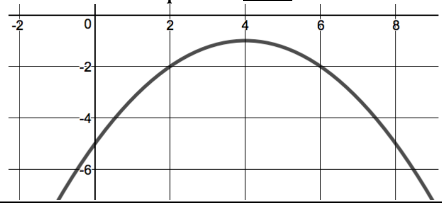
Quadratics:

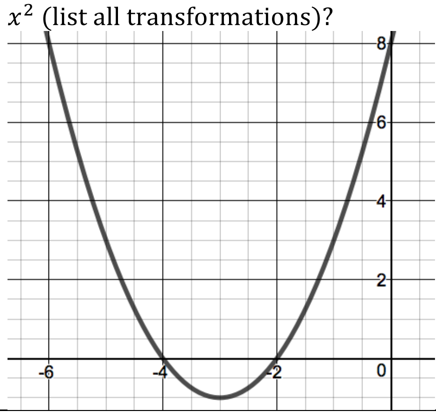
19. Write a function in vertex form that represents a parabola that is translated 4 units to the right and 8 down from the function $f(x) = x^2$?

20. What is the range of the function represented by the graph? Write your answer in the following format: "All real numbers ____ than or equal to _____."

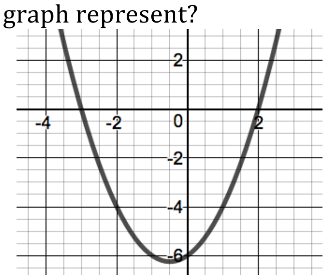


21. What are the roots of the quadratic equation?
$y = 8x^2 + 35x + 12$
a. $x = -4$ and $x = -3$
b. $x = 4$ and $x = 3$
c. $x = -4$ and $x = -0.375$
d. $x = 4$ and $x = 0.375$

22. How is this graph different from a graph of the function $f(x) = x^2$ (list all transformations)?

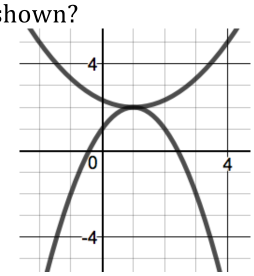


23. Which polynomial does the graph represent?



a. $y = (x + 3)(x + 2)$
b. $y = (x - 3)(x - 2)$
c. $y = (x + 3)(x - 2)$
d. $y = (x - 3)(x + 2)$

24. What are the solution(s) to the system of equations shown?



25. A small rocket on a lunar outpost around Jupiter was launched from a 36-meter platform. The height of the rocket is modeled by the function $h(t) = -3t^2 - 12t + 36$, where t is time in seconds and $h(t)$ is the height of the rocket in meters.
a. What will be the value of $h(t)$ when the rocket hits the ground?
b. Find the time when the rocket hits the ground, clearly showing how you used the equation.

Polynomials:

26. Simplify the expression.
$(6x^2 - 5x) + (x^4 + 3x^2 + 10x)$

27. Simplify the expression.
$(4x - 7)^2$

28. What is the product of the polynomials?
$x - 1$ and $-2x^2 - 6x + 9$

29. Under which operations are the set of irrational numbers NOT closed?
a. Addition
b. Subtraction
c. Multiplication
d. Division

30. In which sets does the number −8.9 NOT belong?
a. Rational numbers
b. Integers
c. Whole Numbers
d. Natural Numbers
e. Irrational Numbers
f. Real Numbers
g. Imaginary Numbers

Final Exam Review – End of Unit 10
Answers:

1. a. $4\ soda \cdot 5\ juice = \boxed{20}$ b. $\frac{2}{5}$ c. $\frac{1}{20}$	2. $\frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \boxed{\frac{16}{81}}$		3. 10
4. B	5. $100 - 25\pi$	6. B	7. 144
8. 9.5 ft	9. 3000 ft	10. SSS	11. C
12. 7 yd	13. 9 m	14. B	15. C
16. A	17. D	18. $f^{-1}(x) = \frac{1}{5}x - 5$	19. $f(x) = (x - 4)^2 - 8$
20. All real numbers les than or equal to –1.	21. C	22. Translated left 3 units and down 1 unit	
23. C	24. $(1, 2)$	25. a. $h(t) = 0$ b. 2 sec.	26. $x^4 + 9x^2 + 5x$
27. $16x^2 - 56x + 49$	28. $-2x^3 - 4x^2 + 15x - 9$	29. B, C & D	30. B, C, D, E & G